

Application number 10/665,991
Amendment dated May 1, 2006
Reply to office action mailed November 2, 2005

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Amendments to the Claims:

This listing of claims will replace all prior versions, and listings of claims in the application:

Listing of Claims:

Claims 1-8. (Cancelled)

Claim 9. (Currently amended) A pressure sensor comprising:
a diaphragm and a sidewall, the sidewall having an interior side defining a
backside opening, ~~the sidewall cavity, the backside cavity extending from a portion of an~~
insulator layer directly in contact with the diaphragm to the a backside opening,
wherein the interior side of the sidewall is formed using a deep reactive ion etch
and is substantially orthogonal to the diaphragm,
wherein the deep reactive ion etch begins at the backside opening and etches
towards the diaphragm at a rate that is substantially reduced when the insulator layer is reached,
and
wherein the backside opening is non-rectangular.

Claim 10. (Original) The pressure sensor of claim 9 wherein the backside
opening forms a rounded square.

Claim 11. (Currently amended) ~~The method~~ pressure sensor of claim 9
wherein the backside opening is shaped as a castle.

Claims 12-14. (Cancelled)

Claim 15. (Currently amended) An absolute pressure sensor comprising:
a first silicon layer comprising a diaphragm having a top and a bottom;
an insulator layer covering the bottom of the diaphragm; and
a second silicon layer below the insulator layer and comprising a sidewall
extending from the insulator layer on the bottom of the diaphragm, the sidewall having an

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interior side forming a backside cavity having a backside opening, the interior side substantially orthogonal to the diaphragm; and

a block covering the backside opening such that a hermetic seal is formed.

Claim 16. (Original) The absolute pressure sensor of claim 15 wherein the block is silicon.

Claim 17. (Original) The absolute pressure sensor of claim 15 wherein the block is glass.

Claim 18. (Currently amended) ~~The absolute pressure sensor of claim 15~~
An absolute pressure sensor comprising:
a diaphragm having a top and a bottom;
a sidewall extending from the bottom of the diaphragm, the sidewall having an
interior side forming a backside cavity having a backside opening, the interior side substantially
orthogonal to the diaphragm; and
a block covering the backside opening such that a hermetic seal is formed,
wherein the block is glass, and
wherein the glass block is covered with metal over the backside opening.

Claim 19. (Cancelled)

Claim 20. (Original) A silicon wafer comprising:
a plurality of pressure sensors, each pressure sensor comprising:
a diaphragm having a top and a bottom; and
a sidewall extending from the bottom of the diaphragm, the sidewall having an interior side formed using a deep reactive ion etch and forming a backside cavity having a backside opening, the interior side substantially orthogonal to the diaphragm,
wherein the plurality of pressure sensors includes approximately at least twenty-thousand pressure sensors,
and wherein the silicon wafer is a 150mm (6 inch) wafer.

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Claim 21. (Original) A pressure sensor apparatus comprising:
exactly one pressure sensor in a housing, the exactly one pressure sensor
comprising:
a diaphragm having a top and a bottom; and
a sidewall extending from the bottom of the diaphragm, the sidewall
having an interior side formed using a deep reactive ion etch and forming a backside cavity
having a backside opening, the interior side substantially orthogonal to the diaphragm,
wherein the diaphragm is less than 350 microns in length, and
the diaphragm accounts for more than 10 percent of an area of the exactly one
pressure sensor.

Claim 22. (Cancelled)

Claim 23. (Currently amended) ~~The pressure sensor of claim 22 further
comprising:~~

A pressure sensor comprising:
a diaphragm having a top and a bottom;
a sidewall extending from the bottom of the diaphragm, the sidewall having an
interior side forming a backside cavity having a backside opening, the interior side substantially
orthogonal to the diaphragm;

a cap attached to the top of the diaphragm;
a first electrode attached to the top of the diaphragm; and
a second electrode attached to an underside of the cap,
wherein the cap and diaphragm form a reference cavity, and
wherein the first electrode and the second electrode form a capacitor.

Claim 24. (Currently amended) ~~The pressure sensor of claim 22 further
comprising~~

A pressure sensor comprising:
a diaphragm having a top and a bottom;

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a sidewall extending from the bottom of the diaphragm, the sidewall having an interior side forming a backside cavity having a backside opening, the interior side substantially orthogonal to the diaphragm;

a cap attached to the top of the diaphragm;

a plurality of resistors in the top of the diaphragm,

wherein the cap and diaphragm form a reference cavity, and

wherein the plurality of resistors form a piezoresistive sensing circuit.

Claim 25. (New) A pressure sensor comprising:

a first silicon layer comprising a diaphragm;

an insulator layer below the first silicon layer;

a second silicon layer below the insulator layer and having a backside cavity defined by a sidewall, a backside opening, and a portion of the insulator layer below and directly in contact with the diaphragm,

wherein the backside cavity is formed using a deep reactive ion etch and the sidewall is substantially orthogonal to the diaphragm,

wherein the backside opening is non-rectangular.

Claim 26. (New) The pressure sensor of claim 25 wherein the backside opening forms a rounded square.

Claim 27. (New) The pressure sensor of claim 25 wherein the backside opening is shaped as a castle.

Claim 28. (New) The pressure sensor of claim 25 further comprising:
a block covering the backside opening such that a hermetic seal is formed.

Claim 29. (New) The pressure sensor of claim 28 wherein the block is silicon.

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Claim 30. (New) The pressure sensor of claim 28 wherein the block is glass.

Claim 31. (New) The pressure sensor of claim 30 wherein the glass block is covered with metal over the backside opening.

Claim 32. (New) A pressure sensor comprising:
a first silicon layer having a top side and a bottom side and comprising a diaphragm;
an insulator layer having a top side and a bottom side, the top side in contact with the bottom side of the first silicon layer;
a second silicon layer having a top side and a bottom side, the top side in contact with the bottom side of the insulator layer and having a backside cavity defined by a sidewall, a portion of the bottom side of the insulator layer, and a backside opening in the bottom side of the second silicon layer,
wherein the backside cavity is formed using a deep reactive ion etch and the sidewall is substantially orthogonal to the diaphragm,

Claim 33. (New) The pressure sensor of claim 32 wherein the backside opening forms a rounded square.

Claim 34. (New) The pressure sensor of claim 32 wherein the backside opening is shaped as a castle.

Claim 35. (New) The pressure sensor of claim 32 further comprising:
a block covering the backside opening such that a hermetic seal is formed.

Claim 36. (New) The pressure sensor of claim 35 wherein the block is silicon.

Claim 37. (New) The pressure sensor of claim 35 wherein the block is glass.

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Claim 38. (New) The pressure sensor of claim 37 wherein the glass block is covered with metal over the backside opening.